FY 98 AMIP PROJECT STATUS REPORT

1. PROJECT TITLE: Standard Object Development

2. PROJECT ID: AMIP-98-OBJ-01

3. SPONSORING AGENCY: US Army Materiel Systems Analysis Activity (AMSAA)

4. ACCOMPLISHMENTS: The OMSC conducted a review, testing, and revision of the Platform Object and Unit Object for nomination as an Army object standard. Additionally, the OMSC developed the Location Object and the Data Object. The Environment Object template development, comprised of a Terrain Object, Atmosphere Object, Space Object, and Ocean Object, was initiated. Also initiated was a framework that defines the behaviors required in M&S and the development of an approach to integrate the behaviors into objects.

The following is a synopsis of the OMSC's FY98 accomplishments:

- Platform Object. Using the component-based approach developed by the Standard Army Model and Simulation Objects (SAMSO) Study, the OMSC reviewed the SAMSO study approach and output related to the draft Platform Object. To explore the capability of the Platform Object to address expected M&S platform implementation; the OMSC conducted a number of M&S test applications. The simulations chosen for the test applications were the AMSAA Groundwars simulation and the TRAC-WSMR CASTFOREM/COMBAT XXI simulation. Additionally, to gain a broader perspective on the application of the draft Platform Object to other M&S domains, an overview of the draft Platform Object was provided to the Army M&S Management Program Working Group (AMSMP WG) and the Army M&S Standard Categories for review. Comments were collected to determine changes necessary to the Platform Object needed to address differing M&S requirements. Based on the review and application to a set of M&S, an updated version of the draft SAMSO Platform Object was developed and submitted to the Standards Nomination and Approval Process (SNAP) and the Army Standards Repository System (ASTARS). A report was written that documented the SAMSO study results; the test applications using Groundwars and CASTFOREM/COMBAT XXI; crosswalk with WARSIM 2000 and the Logistics SC set of combat simulation requirements; and the final set of Platform Object components, methods, and definitions.
- Unit Object. As performed for the Platform Object, the OMSC reviewed the SAMSO study approach and output related to the draft Unit Object. To explore the capability of the Unit Object to address expected M&S implementation; the OMSC conducted an M&S test application. The simulation chosen for the test application was the TRAC-FLVN AWARS simulation. Additionally, to gain a broader perspective on the application of the draft Unit Object to other M&S domains, an overview of the draft Unit Object was provided to the Army M&S Management Program Working Group (AMSMP WG) and the Army M&S Standard Categories for review. Comments were collected to determine changes necessary to the Unit Object needed to address differing M&S requirements. Based on the review and M&S application, an updated version of the draft SAMSO Unit Object was developed and

submitted to the Standards Nomination and Approval Process (SNAP) and the Army Standards Repository System (ASTARS). A report was written that documented the SAMSO study results; the test applications AWARS; crosswalk with WARSIM 2000, ARES, and the Logistics SC set of combat simulation requirements; and the final set of Unit Object components, methods, and definitions.

- Location Object. This object consists of the Local Object and the LatLon Object. The notion of location is fundamental to most military simulations. There are numerous coordinate systems used in simulation, each appropriate for some simulations and not suitable for others. A common, abstract location object can foster interoperability among simulations that use different coordinate schemes. An initial report was drafted to define the objects, object methods, and object definitions.
- Data Object: This object consists of the Data Requestor, Data Collector, and Data Event Listener. This object allows the M&S user to use a general data services that can be tailored to address unique study analysis data requirements. A report is being drafted to define the objects, object methods, and object definitions.
- Environmental Object. An Environment Object template was defined to represent the overall environment is which the simulation would transpire. The Environment Object is comprised of a Terrain Object, Atmosphere Object, Space Object, and Ocean Object. The OMSC initiated development of the Terrain Object and the object methods that are considered the minimum essential to represent terrain.
- Website Development. The OMSC created a website that lists the relevant documentation and briefings associated with FY97/98 object development.

5. LESSONS LEARNED: A significant lessons learned obtained from this project is the importance of conducting a "dry-run" application of proposed objects with existing or developmental M&S (e.g, CASTFOREM, AWARS, WARSIM). This allows one to gain confidence in the ability of the draft object to address the issue at hand as well as identify any areas that were not covered during the design phase. The project also provided strong validation of the applicability and flexibility of the component approach to object development. A second lesson learned deals with the importance of coordination of the proposed drafts with the M&S community. The OMSC coordinated with the P&T WG through AMSO and the SCs through the reflectors. Although comments received from the coordination were limited, those comments received did have important information that was used in the object refinement. Additionally, the coordination provided an educational aspect of the object development and, while only a limited number of comments were generated, the coordination messages were forwarded to other M&S development addresses that increased object development awareness.

6. BENEFITS TO THE ARMY: This project supports Army efforts to pursue model and simulation interoperability and reuse. The ultimate benefits to be derived from the availability of standard Army objects include:

- reduced knowledge engineering development efforts for new models
- enhanced interoperability/interactivity
- reduction in duplication of effort, and
- identification of investment opportunities to address modeling and simulation voids.

7. WORK REMAINING TO BE COMPLETED:

- Publication of Platform Object Report
- Publication of Unit Object Report
- Coordination, and publication of the Location Object
- Review, coordination, and publication of the Data Object

8. SCHEDULES WITH MILESTONES:

• Dry-run of Platform Object via Groundwars	Sep 97
• Dry-run of Platform Object via CASTFOREM/COMBAT XXI	Oct 97
• OMSC Website developed	Oct 97
• Dry-run of Unit Object via AWARS	Nov 97
• Dry-run of Unit Object via ARES	Dec 97
• Dry-run of Unit Object via WARSIM	Jan 98
• Refinement of Platform Object	Feb 98
• Refinement of Unit Object	Mar 98
• OMSC coordination of Platform/Unit Object	Apr 98
• Development of Data Object	Apr 98
• Development of Environment Object Template	May 98
• Coordination of Platform/Unit Object w/P&T WG & SCs	June 98
• Drafting/review of Platform Object Report	July 98
• Drafting/review of Unit Object Report	July 98
• Drafting/review of Location Object Report	Aug 98
• Drafting/review of Data Object Report	Aug 98
• Publication of Platform Object Report	Aug 98
• Publication of Unit Object Report	Aug 98
• Coordination/Publication of Location Object Report	Sep 98
• Coordination/Publication of Data Object Report	Sep 98

9. **POINT OF CONTACT**: Director, AMSAA
Attn: AMXSY-CS (Don Hodge)
392 Hopkins Road
Aberdeen Proving Ground, MD 21005-5071
(410) 278-6540, DSN 298-6540
fax: (410) 278-6585
email: dhodge.arl.mil